

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

**Listing of Claims:**

Claims 1-4 (Canceled).

5. (Currently Amended) ~~The~~ An imaging apparatus according to claim 3, comprising:

an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;

5 dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal;

dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting a  
10 clip level for a subject component of the imaging signal, based on the detected dark output level; and

test imaging means for capturing a test image by performing a charge storage and readout operation of said imaging device for a test imaging time while shielding said imaging device from  
15 exposure;

wherein the dark output level detection means detects the dark output level by deriving a dark output level of an actual imaging based on said test imaging time, an imaging device output level obtained by said test imaging means, and a charge storage  
20 time for exposure control of the actual imaging; and

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

wherein the test imaging time and the charge storage time ~~at~~  
of the actual imaging ~~time~~ are different from each other, and the  
dark output level ~~at~~ of the actual imaging time is derived by  
multiplying the imaging device output level X obtained by said  
25 test imaging means by a ratio Y/Z of the test imaging time Y of  
said test imaging means to the charge storage time Z for exposure  
control at the actual imaging time.

6. (Currently Amended) The imaging apparatus according to  
claim 5, wherein the test imaging time is shorter than the charge  
storage time ~~at~~ of the actual imaging time.

Claims 7-9 (Canceled).

10. (Currently Amended) ~~The~~ An imaging apparatus ~~according~~  
~~to claim 8, comprising:~~

an imaging device which includes a plurality of pixels  
arranged two-dimensionally, and which outputs an imaging signal;  
5 dark output level detecting means for detecting, for each of  
the plurality of pixels, a dark output level superposed on the  
imaging signal;

dark output correction means for correcting the imaging  
signal based on the detected dark output level, and for setting

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

10 an effective gain for a subject component of the imaging signal,  
based on the detected dark output level; and

test imaging means for capturing a test image by performing  
a charge storage and readout operation of said imaging device for  
a test imaging time while shielding said imaging device from  
15 exposure;

wherein the dark output level detection means detects the  
dark output level by deriving a dark output level of an actual  
imaging based on said test imaging time, an imaging device output  
level obtained by said test imaging means, and a charge storage  
20 time for exposure control of the actual imaging; and

wherein the test imaging time and the charge storage time ~~at~~  
of the actual imaging time are different from each other, and the  
dark output level ~~at~~ of the actual imaging time is derived by  
multiplying the imaging device output level X obtained by said  
25 test imaging means by a ratio Y/Z of the test imaging time Y of  
said test imaging means to the charge storage time Z for exposure  
control at the actual imaging time.

11. (Currently Amended) The imaging apparatus according to  
claim 10, wherein the test imaging time is shorter than the  
charge storage time ~~at~~ of the actual imaging time.

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

12. (Currently Amended) ~~The~~ An imaging apparatus according to ~~claim 7,~~ comprising:

an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;

dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal; and

dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting an effective gain for a subject component of the imaging signal, based on the detected dark output level;

wherein a value of the effective gain set by said dark output correction means is determined based on a resultant value obtained by dividing "a (i) a value corresponding to the a saturation level on the an output side of said dark output correction means" means by (ii) a difference between "a a value corresponding to the a saturation level on the an input side of said dark output correction means" means and "the a maximum value of the dark output level detected by said dark output level detecting means" means.

13. (Currently Amended) The imaging apparatus according to claim 12, wherein the value of the effective gain set by said

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

dark output correction means is not smaller than the said  
resultant value of ~~the above division~~.

14. (Original) The imaging apparatus according to claim 13,  
wherein the value of the effective gain set by said dark output  
correction means is controlled in a stepwise fashion.

15. (Currently Amended) The imaging apparatus according to  
claim 12, wherein the value of the effective gain set by said  
dark output correction means is equal to the said resultant value  
of ~~the above division~~.

Claims 16-20 (Canceled).

21. (Currently Amended) ~~The~~ An imaging apparatus according  
to ~~claim 19,~~ comprising:

an imaging device which includes a plurality of pixels  
arranged two-dimensionally, and which outputs an imaging signal;

5 dark output level detecting means for detecting, for each of  
the plurality of pixels, a dark output level superposed on the  
imaging signal;

dark output correction means for correcting the imaging  
signal based on the detected dark output level, and for setting a

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

10 clip level and an effective gain for the corrected imaging  
signal, based on the detected dark output level; and  
test imaging means for capturing a test image by performing  
a charge storage and readout operation of said imaging device for  
a test imaging time while shielding said imaging device from  
15 exposure;

wherein the dark output level detection means detects the  
dark output level by deriving a dark output level of an actual  
imaging based on said test imaging time, an imaging device output  
level obtained by said test imaging means, and a charge storage  
20 time for exposure control of the actual imaging; and

wherein the test imaging time and the charge storage time at  
of the actual imaging time are different from each other, and the  
dark output level at of the actual imaging time is derived by  
multiplying the imaging device output level X obtained by said  
25 test imaging means by a ratio Y/Z of the test imaging time Y of  
said test imaging means to the charge storage time Z for exposure  
control at the actual imaging time.

22. (Currently Amended) The imaging apparatus according to  
claim 21, wherein the test imaging time is shorter than the  
charge storage time ~~at~~ of the actual imaging time.

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

23. (Currently Amended) ~~The~~ An imaging apparatus according to ~~claim 17,~~ comprising:

an imaging device which includes a plurality of pixels arranged two-dimensionally, and which outputs an imaging signal;

5 dark output level detecting means for detecting, for each of the plurality of pixels, a dark output level superposed on the imaging signal; and

dark output correction means for correcting the imaging signal based on the detected dark output level, and for setting a  
10 clip level and an effective gain for the corrected imaging signal, based on the detected dark output level;

wherein a value of the effective gain set by said dark output correction means is determined based on a resultant value obtained by dividing "~~a~~ (i) a value corresponding to ~~the~~ a saturation level on the an output side of said dark output correction means" means by (ii) a difference between "~~a~~ a value corresponding to ~~the~~ a saturation level on ~~the~~ an input side of said dark output correction means" means and "~~the~~ a maximum value of the dark output level detected by said dark output level

15

20 detecting means" means.

24. (Currently Amended) The imaging apparatus according to claim 23, wherein the value of the effective gain set by said

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

dark output correction means is not smaller than ~~the~~ said  
resultant value of ~~the above division~~.

25. (Original) The imaging apparatus according to claim 24,  
wherein the value of the effective gain set by said dark output  
correction means is controlled in a stepwise fashion.

26. (Currently Amended) The imaging apparatus according to  
claim 23, wherein the value of the effective gain set by said  
dark output correction means is equal to ~~the~~ said resultant value  
of ~~the above division~~.

Claim 27 (Canceled).

28. (Currently Amended) An imaging apparatus comprising:  
an imaging device ~~having~~ which includes a plurality of  
pixels arranged ~~in a two dimensional fashion~~ two-dimensionally,  
and which outputs and imaging signal;

5        dark output level detecting means for detecting, for each of  
the plurality of pixels, a dark output level ~~for each pixel~~  
superposed on ~~an~~ the imaging signal ~~which is an output signal of~~  
~~the imaging device;~~

10        dark output correction means for correcting the imaging  
signal by eliminating a dark output component from the imaging



Application No. 09/772,662  
Response to Office Action

Customer No. 01933

signal for said each pixel based on the detected dark output  
level ~~detected by said dark output level detecting means, for~~  
setting a clip level for the corrected imaging signal ~~according~~  
~~to the~~ based on a maximum value of the detected dark output  
15 level, ~~detected by said dark output level detecting means and for~~  
setting an effective gain for the corrected imaging signal  
~~according to~~ based on the set clip level; and  
exposure correction means for correcting exposure of said  
imaging device ~~according to~~ based on the set gain ~~setting in said~~  
20 ~~dark output correction means.~~

Claim 29 (Canceled).

30. (Currently Amended) An imaging method comprising ~~the~~  
~~steps of:~~

imaging a subject ~~by use of~~ with an imaging device which ~~has~~  
includes a plurality of pixels arranged in ~~a two dimensional~~  
5 fashion two-dimensionally, and which outputs an imaging signal;  
detecting, for each of the plurality of pixels, a dark  
output level ~~for each pixel superposed on an~~ the imaging signal  
~~obtained by imaging the subject;~~  
correcting the imaging signal based on the detected dark  
10 output level;

Application No. 09/772,662  
Response to Office Action

Customer No. 01933

setting a clip level for the corrected imaging signal  
~~according to~~ based on the detected dark output level;

setting an effective gain for the corrected imaging signal  
~~according to~~ based on the set clip level; and

15 controlling exposure of the imaging device according to the  
set gain.